THE STRATIGRAPHIC SEQUENCE AT ROLLINS SHELL RING: IMPLICATIONS FOR RING FUNCTION

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Shell rings are poorly understood features of the Middle and Late Archaic landscape in the lower Southeast. Constructed between ca. 4500 and 3000 years ago, these circular- to arc-shaped deposits of shell range in diameter from 30 to 250 m and can reach over 6 m in height. Shell rings are distributed along the lower Atlantic coast from South Carolina to southern Florida; somewhat similar structures are found along the northern Gulf coast as far west as the Pearl River at the Mississippi/Louisiana border as well as along the southwestern Gulf coast (Figure 1). Thus, rings are known from all of the coastal manifestations of the various fiber-tempered pottery-producing cultures. However, rings are not restricted to those cultures. Several preceramic-age rings are known and a ring containing a spiculate ware (St. Johns?) and sand tempered sherds, dated to ca. 3300 B.P., is present on Jupiter Island, Florida (Russo and Heide 2002). As noted above, rings also extend to central South Carolina, where they are associated with Thoms Creek pottery, a ware with a sandy paste and few or no fiber inclusions.

Previous Considerations of Shell Ring Function

Since they were first described, by William McKinley in 1873, shell rings have captured the imagination of avocational and professional archaeologists alike. Against a backdrop of contemporaneous amorphous shell middens and artifact scatters (DePratter 1979; Waring 1968a), rings are impressive structures. Writing of the three rings on Sapelo Island, McKinley (1873) was taken by the height of the largest of the three, over six meters of near vertical wall (three meters of shell on three meters of sandy bluff), the apparent sterile interior of each ring, and the relative symmetry of the shell structures. Though overstated—modern maps (e.g., Russo and Heide 2001) have shown that many rings have irregularities in ring height and shape and interiors sometimes do have features (the Ford Shell Rings, for example; Calmes 1967)—these characteristics are often cited by researchers in consideration of function (e.g., Waring and Larson 1968:273). McKinley (1873:422-428) proposed that the rings were "doubtless for council and games" with the largest operating as a "house of state" and "torture chamber" and the lesser circles as places for dance, sports, and games. Others have speculated that rings functioned as fish weirs (Edwards 1965; Waring 1968b:182), or were midden accumulations around the edges of raised structures that served as primary fishing stations (Waring 1968b:183). Ultimately, Waring (1968a) and Waring and Larson (1968) concluded that rings were the earliest monumental architecture in the Americas; Michie (1979) and Sassaman (1993) also attributed a ceremonial rather than a simple settlement function to shell rings. Marrinan (1975:117) was ultimately noncommittal as to ring function, but she did note (1975:95) that "the attention to symmetry and the recognition of a collective desire for this sort of edifice is as real as any Midwestern earthen effigy mound or British long barrow." DePratter and Howard (1980:8) also leave the question of ring function open, though DePratter (1979:50) identified a possible domestic structure (based on a circular area of crushed shell and a possible hearth located in the ring) at the A. Busch Krick ring site.

During the heyday of diffusionist explanations, Ford (1966, 1969) noted the similarity of southeastern rings to shell rings in coastal Columbia and proposed (Ford 1969:185) that the appearance of rings and fiber-tempered pottery in the Southeast could be attributed to direct colonization of the Savannah River valley and adjacent coast by peoples from the area of the Isthmus of Panama. Thus, to Ford, rings on the Georgia coast were no more than the transplantation of a South American domestic settlement pattern to the Southeast. More recently, Trinkley's (1985; see also Trinkley 1997) influential paper on shell ring function echoed Ford's assessment. Based on a review of past investigations, in particular the (unpublished) work at Chester Field undertaken by Ritter and Moorehead in 1932 and 1933, respectively, and his fieldwork at Lighthouse Point and Stratton Place in Charleston County, South Carolina, Trinkley proposed that rings were secular habitation sites. He (Trinkley 1985:118) argued "that the circular shape was related to the egalitarian nature of Early Woodland societies, where a circular clustering of habitations would promote communication and social interaction." Trinkley (1985:117; 1997) used the "kitchen refuse" nature of the midden remains, the pronounced banding and crushing of midden and artifacts reported for Chester Field and observed at the base of the Charleston County rings, and the presence of numerous postholes and steaming and roasting pits at the base of many shell rings, as support for a domestic as opposed to a ceremonial function for the sites. Cable (1997), however, found Trinkley's "gradual accumulation theory" of ring formation untenable[1]. Reviewing the stratigraphic sequence of the Sea Pines and Skull Creek shell rings, Cable argued that the defining feature of these deposits was the presence of large piles of unconsolidated shell capped by thin lenses of crushed shell. Cable hypothesized that these deposits were intention-

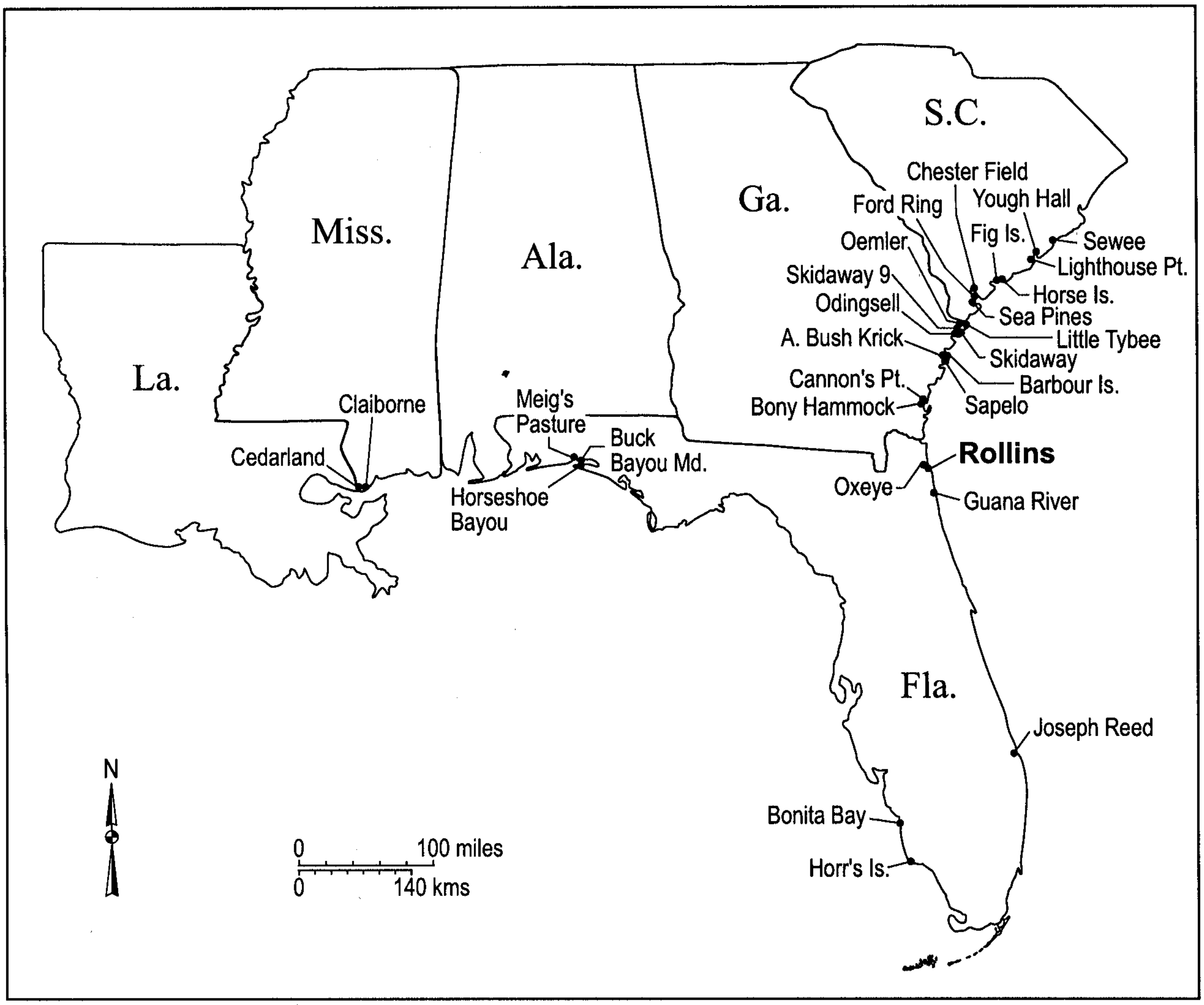

Figure 1. Location of Rollins Shell Ring and other southeastern shell rings.

ally mounded remains from feasts occurring every 10 to 20 years. Numerous contemporaneous habitation sites around the Sewee shell ring indicated to Cable that the Sewee ring also had a special function[2]. On the basis of the nature of the deposits and zooarchaeological remains, Russo and Heide (2002) argued for feasting at the Joseph Reed shell ring (8MT13) near Cape Canaveral; Russo et al. (2002) took the ceremonial function of rings for granted in their discussion of the Guana Shell Ring.

In 1998, work was undertaken at the Rollins Shell Ring in northeastern Florida as part of a larger project (Russo and Saunders 1999) to explore the evolution and function—secular or ceremonial—of several shell rings on the northeastern coast of Florida. This initial effort at Rollins was limited in scope. The research was designed to: 1) produce a detailed topographic map of the site; 2) use soil chemistry to determine whether some portions of the Rollins ring may have been borrowed for shell; 3) secure good radiocarbon dates for the initial and final construction stages of the ring; 4) record microstrata to understand how the Rollins ring was constructed; 5) develop seasonal data to determine seasons of site deposition; and 6) to recover a good sample of artifacts that might indicate activities at the site (Russo and Saunders 1999). Results from this research provide additional hard data on the characteristics of shell rings; data upon which testable hypotheses about shell ring function can be based. Here the emphasis is on the implications of the stratigraphic sequence and the composition of the strata at the ring. A more complete account of results of these excavations can be found in Saunders (2003).

Rollins Shell Ring

Rollins Shell Ring is a topographically complex site (Figures 2 and 3). It is one of the larger of the known ring sites at 250 m in diameter (150 m across the interior) and over 4 m in height above the surrounding terrain[3]. The main ring is generally horseshoe-shaped. Conventional radiocarbon dates from basal midden deposits from the trench excavated on the west side of the ring and basal midden deposits from 1 x 2

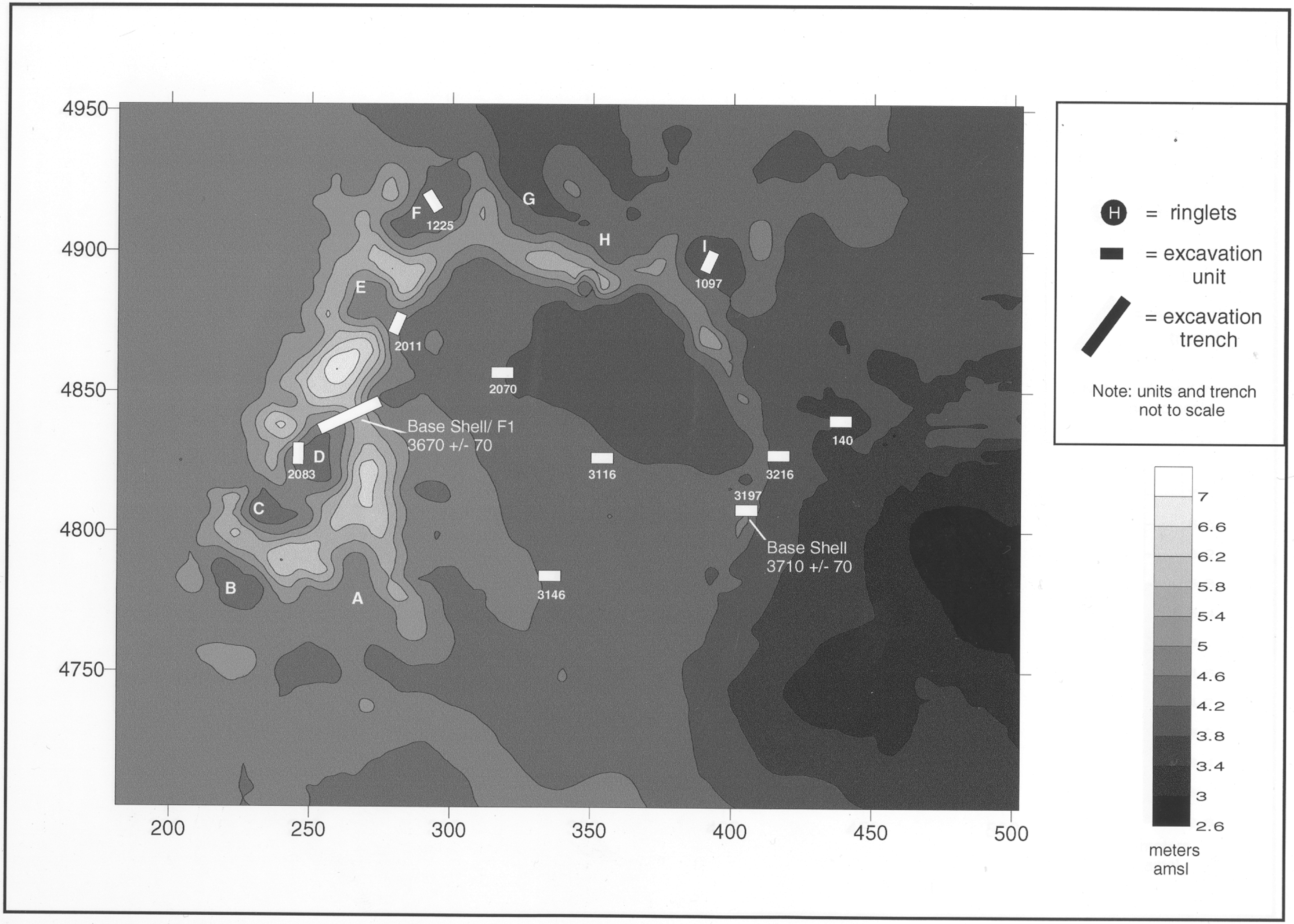

Figure 2. Rollins topographic map with 1998 excavation units (units not to scale).

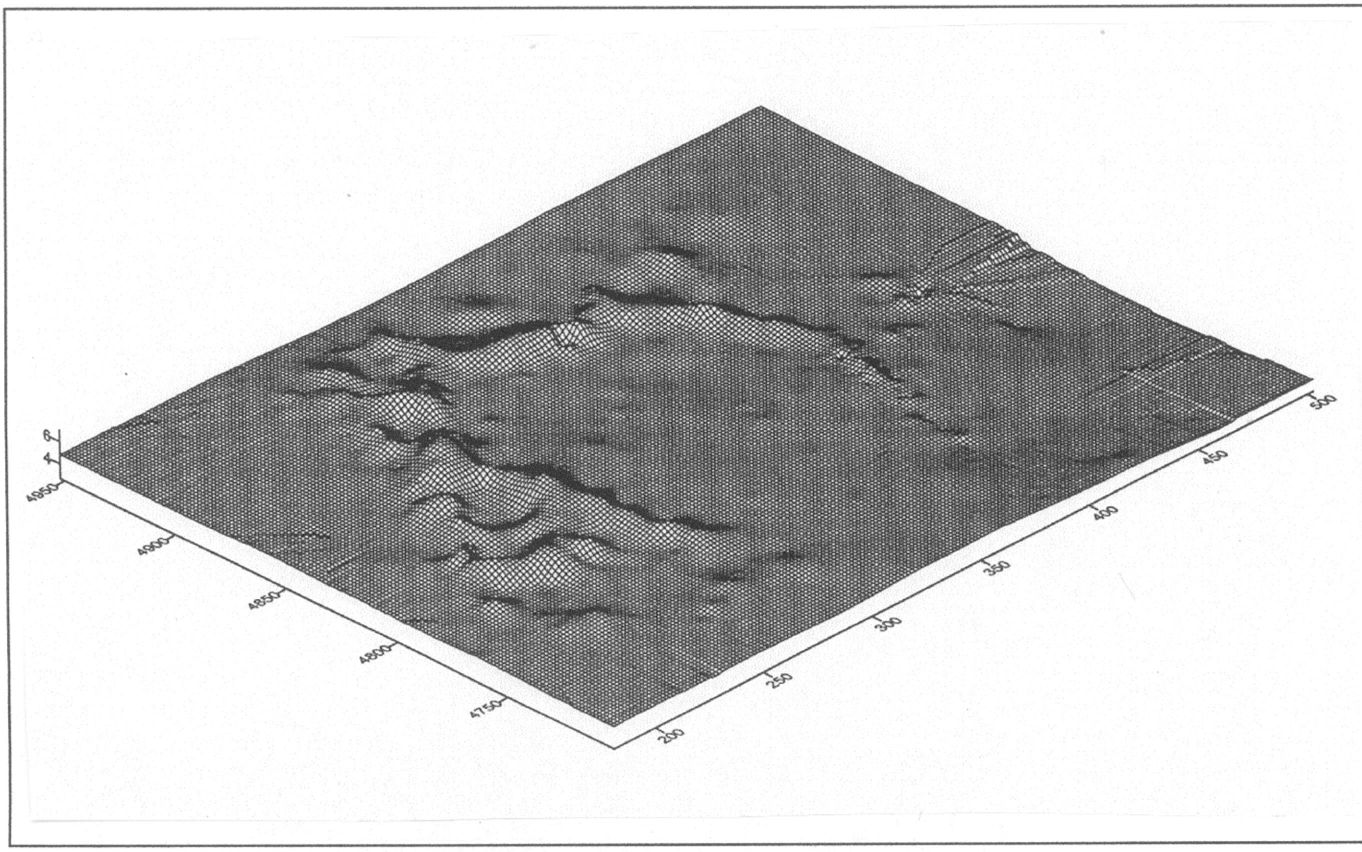

Figure 3. Rollins topographic map, wire contour.

m Unit 3197 on the east side of the ring are, for all practical purposes, contemporaneous at about 3600 cal B.P. (Figure 3; Table 1), or in the Orange III period. The contemporaneity between the arms of the ring indicates that the horseshoe shape and overall site size was inherent in the original plan of the site and that it was maintained throughout the occupation of the site—probably some two to three hundred years (further dating of the site is discussed below).

The Rollins ring is decidedly asymmetrical (Figures 2 and 3). The western portion of the ring is appreciably broader and higher than the eastern arm. In addition, at least nine smaller enclosures or "ringlets" are arranged around the western and northern sides but are absent from the eastern arm[4]. Because the highest and broadest portions of the ring are associated with the presence of the well-defined smaller enclosures, the ringlets may be at least partially responsible for the difference in ring height and width from west to east. There has been insufficient excavation in these areas to determine how the enclosures articulated with the main ring; that is, whether they were contemporaneous with, preceded, or postdated initial ring construction. However, complementary excavations at the Fig Island shell ring site (38CH42) in South Carolina indicate they may be younger. At Fig Island, one smaller enclosure attached to the enormous Fig Island 1 ring was radiocarbon dated ca. 200 years younger than the main ring deposits (Saunders 2002b).

Trench Excavations, 1998

Ten 1 x 2 m units were excavated throughout the site, one on the east arm of the ring (Unit 3197) and the nine others in non-shell main ring or ringlet centers. Results of these excavations are reported in Saunders (2003). Within the ring itself, a 1 x 16 m trench was excavated on the western side of the ring (Figure 3). The trench was laid out northeast to southwest between two of the highest peaks of shell on the site. In addition to providing material cultural and other evidence of site activities, the trench was intended to bisect the ring feature as a whole and to provide stratigraphic evidence of the depositional events that made up the ring. Most important was to determine whether the ring was composed of lenses of compacted, accretional midden resulting from daily refuse discard or of large deposits with little postdepositional disturbance indicative of feasting (or both).

Trench profiles (Figure 4) revealed that the bulk of the ring was composed of a massive shell pile, designated Feature 1 during excavation (all features are listed in Table 2)[5]. Though this was disturbed by intrusions (in Figure 4, these intrusions are the vertical lenses of what is keyed as "A1" in Excavation Units 1 and 2, north and south profiles; and "C4" and "E3" in the north wall profile at the boundary of Units 2 and 4), and stratigraphy is not as straightforward as one would like[6], both the north and south wall profiles indicated three episodes of rapid shell deposition creating the core of the ring (Figure 4,

Table 1. Radiocarbon dates from Rollins Shell Ring.[1]

FS #	Description	Sample	Measured B.P.	Conventional B.P.	$\delta^{13}C_{PDB}$	2/1 cal - 1/2 cal. delta R -5 ± 20	2 /1 cal (intercept) 1/2cal delta R 36 ± 14	Lab #
85	Trench 1, Unit 2, Feature 1, bottom deposit, 90-100 cm bs.	Oyster	3300 ± 70	3670	-2.5‰	3767/3658 - 3477/3398	3692/3617 (3537) 3449/3363	Beta-119816
281	Unit 1097, Ringlet J, pit feature.	Oyster	2100 ± 70	2460	-3.0‰	2297/2200 -1999/1941	2266/2142 (2054) 1961/1892	GX-29516
459	Trench 1, Feature 11, base (initial occupation); 200 cm bs.	Bulk Carbon	3741 ± 80	3730	-25.6‰		4300/4157 (4088) 3975/3841[2]	GX-25750
467	3197, 10-20 cm bs, midden.	Oyster	2340 ± 60	2690	-3.7‰	2655/2470 – 2309/2259	2518/2437 (2329) 2275/2149	WK-7433
488	Trench 1, Unit 1, Feature 1, top deposit, 33 cm bs.	Oyster	3229 ± 60	3600	-2.4‰	3638/3570 – 3419/3353	3601/3518 (3445) 3375/3324	WK-7438
508	3197, 80-90 cm bs, midden.	Oyster	3300 ± 70	3710	-0.3‰	3818/3720 – 3528/3455	3761/3653 (3576) 3476/3399	Beta-119817
Timu	4850N/250E, 60-65 cm bs (Russo 1993).	Oyster	3360 ± 60	3760	na.	3860/3776 – 3620/3533	3805/3715 (3634) 3554/3479	Beta-50155

1. I have included two different reservoir correction values, -5 ± 20, which has been the most commonly used value, and is the value still used by Beta Analytic (Darden Hood, personal communication, 2004), and 36 ± 14, which is the value currently posted for southern Florida and the Bahamas at http://radiocarbon.pa.qub.ac.uk/marine/. As can be seen, the newer value does narrow age ranges significantly. I have also included calibrated intercepts, calibrated with Calib 4.3. While these are just a midpoint within the range and do not represent the most likely date, they are a useful shorthand for comparison. All calibrated ranges were calibrated with Calib 4.4.
2. Reservoir corrections do not apply to this bulk carbon date.

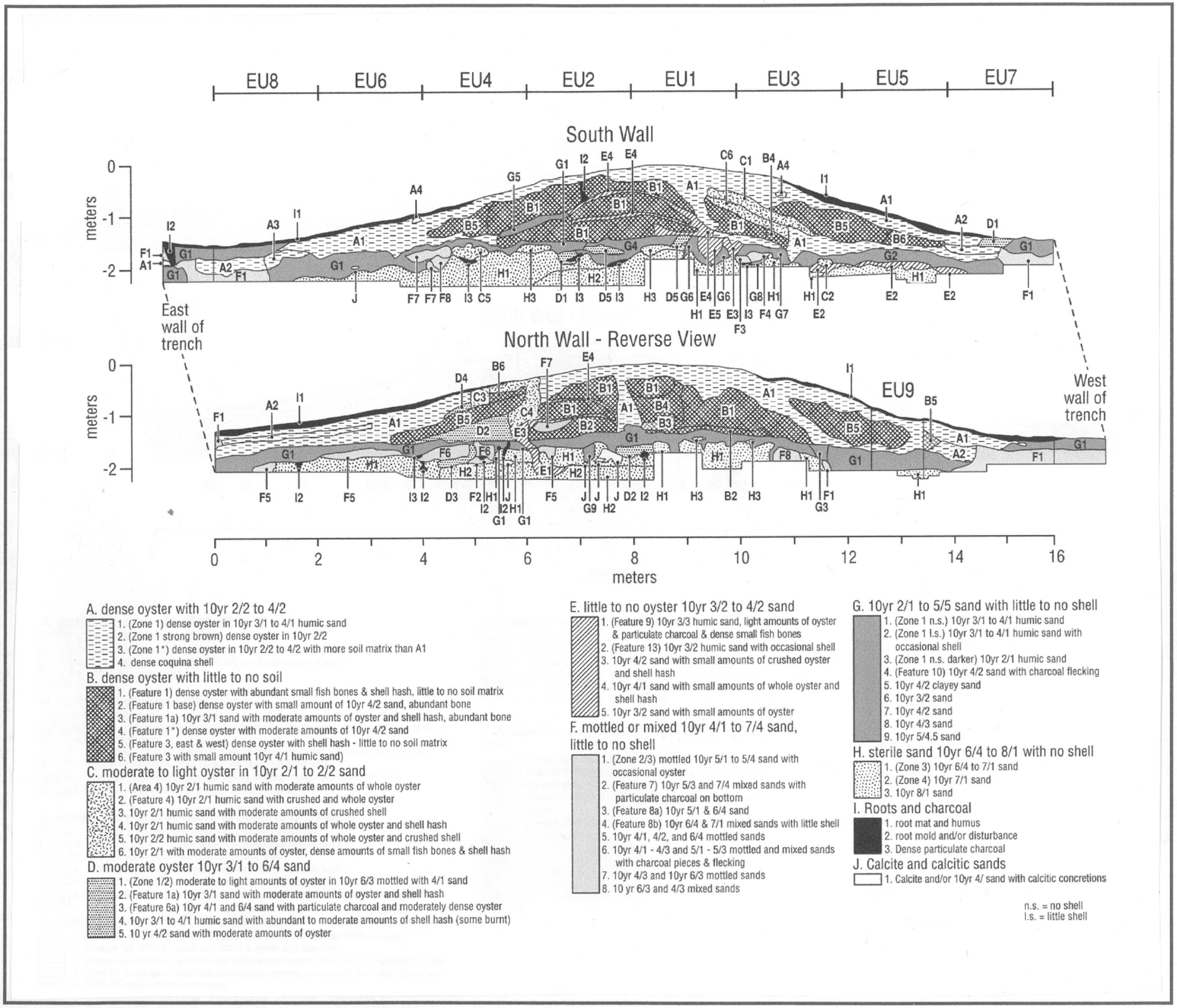

Figure 4. Rollins trench profiles, south and north walls.

Table 2. Trench Features at Rollins Shell Ring.[1]

Feature #	Location	Top (mbs)	Base (mbs)	Description
1	Units 1, 2; expands to Unit 4 in Level 7, Unit 3 in Level 8	.20	1.35	Includes three distinct deposits of abundant large, whole, clean oyster, abundant, fine bone, almost no soil. Relative to Zone A, more crab claws, burned and unburned, very little periwinkle.
2	Unit 2	.5	n/a	Abundant oyster with small amount of sandy, brown (10YR 5/3) matrix at top—which prompted segregation from Feature 1. This sand disappeared by base of Level 6, and the Feature could not be distinguished from Feature 1. Combined with Feature 1 after segregating for one level
3 East 3 West	Unit 4 Units 3, 5	1.10	1.30	Deposit of abundant large, whole, clean oyster similar to Feature 1, but some dark gray (10YR4/1) humic sand matrix, fine shell hash. Present on east and west sides of Feature 1.
4	Units 3, 5	1.60	1.70	Semi-oval area of abundant coquina shell in dark gray to black humic sand; admixed with Zone 1 (10YR 3/1-4/1) matrix.
5	Units 4, 6	1.60	1.92	Amorphous area heavily mottled very dark grayish brown, black (10YR 3/2, 10YR 2/1) humic sand, scattered shell, charcoal, calcium concretions. May be combination of low spot in earth midden (Zone 1 no shell) underlying shell and root disturbance.
6 6a	Unit 4	1.60	1.80 1.80	Subrectangular area of very dark brown brown (10YR 2/2) humic sand, scattered shell, charcoal, calcium concretions adjacent to Feature 5. 6a had common shell in similar matrix; north wall profile indicates a separate feature from 6.
7	Unit 4	1.60	1.80	Subrectangular area of brown and very pale brown (10YR 4/3 – 5/3, 10YR 7/3 – 7/4) mixed sands; bottoms out onto circular area of particulate charcoal mixed with sand.
8	Units 1, 3	1.60	1.88	Semi-oval area of brown and very pale brown mixed sands. Profiled in south wall. Bottoms out onto particulate charcoal.
9 9a	Unit 2 Unit 2	1.60	2.20 1.85	Large, semi-oval area of brown and very pale brown mixed sands, some mottling with more humic sands, pockets of oyster. 9a has more humic sand and shell; also contained more bone that 9.
10	Unit 2	1.60	1.88	Semi-subrectangular area of mixed brown and very pale brown sands, profiled in south wall. Bottoms out onto lens of particulate charcoal mixed with sand.
11	Unit 1	1.60	1.80	Amorphous area of mixed brown and very pale brown sands; bottoms out onto particulate charcoal mixed with sand.
12	Unit 3	1.60	1.88	Amorphous area of mixed brown and and very pale brown sands, pockets of oyster shell adjacent to Feature 8. Profiled in south wall. Bottoms out onto particulate charcoal mixed with sand. Though consistently lighter than Feature 8, profile suggests same episode.
13	Units 3, 5, 7	1.80	1.90	Trench bisected possible circular area of very dark grayish-brown (10YR 3/2) humic sand with very occasional shell, scattered crushed shell along western margin. Apparently a low area of the earth midden underlying shell.
14	Unit 7	1.90	2.04	Subcircular area of darker, humic sand (10YR 2/2, 10YR 3/2) below Feature 13.
'Areas' of probable cultural origin:				
Area 4, 4a Area 4b	Units 1, 3	.50 1.10	1.15	Linear area of very dark gray to black (10YR3/1, 10YR 2/1) humic sand extending between Zone 1 and Feature 1 on west side of trench. 4b contained moderate broken and whole shell.
Area 15	Unit 4	1.60	1.80	Semi-circular area of mixed brown and very pale brown sands, profiled in south wall. Bottoms out onto lens of particulate charcoal mixed with sand.

1. Elevations are with reference to a datum at ground surface at the highest point along the trench, the southeast corner of Unit 1.

B1-B4). Each of the discrete episodes was separated by thin lenses of sand or clayey sand. According to our soil scientist, Sylvia Scudder (personal communication, 1998), these were not aeolian deposits and so must have been anthropogenically introduced. Because these sand lenses were not visible during excavation, all three episodes were excavated as Feature 1.

Each of the three deposits of Feature 1 was composed primarily of large, whole, clean oyster shells with virtually no soil incorporated into the deposit. There was little breakage or other compaction of the shell that might result from living on, or any other intense use of, the surface of each of these deposits. Lacking any soil or sediment matrix, and lacking compaction, the shell was extremely loose. Shell orientation was variable, ranging from horizontal to vertical. Small fish bone was abundant in these deposits; most upturned oyster shells cupped scores of tiny bones. The large, clean oyster, the jumbled appearance of the shell, and the lack of soil might suggest that Feature 1 was a secondary deposit transported from a nearby area to the ridge by means of loosely woven baskets that permitted smaller shells and soil to filter out. The presence of the innumerable small fish bones, however, argued against this conclusion.

Deposits similar in composition to Feature 1 appeared on either side of the feature. These deposits (Feature 3 East and Feature 3 West, keyed as B5 in Figure 4) had the same loose, large, clean oyster shell but contained a small amount of sand and abundant shell hash. These physically separate deposits were so similar that, initially at least, Feature 1 could have been considered an intrusion into this already-extent deposit; using the same designation for both was intended to highlight this fact. In profile, it is clear that these were deposited after Feature 1. On the western half of the south wall, Feature 3 West was separated from Feature 1 by two lenses of very dark, organically enriched sand with only amounts of whole oyster (Figure 4, South Wall, C1 and C6). These were excavated as Area 4a and Area 4b. This is lacking in the south wall on the east side, but may be visible on the east side of the north wall where disturbances C4 and E3 are present. On the western portion of the north wall, A1 between B1 and B5 appears to be the equivalent. Feature 1, Feature 3, and these lenses comprise the principal deposits of the core of the ring. There were no other deposits in the core of the ring; nothing—no postholes, pits, hearths, etc.—indicative of habitation on the ring during or immediately after the deposition any of these proveniences.

All of these deposits were overlain with a dense shell midden, referred to as Zone 1. Zone 1 was composed of abundant whole and crushed oyster in a dark grayish-brown, organically enriched sand; very similar to midden descriptions from sites of many time periods along the coast. In the south wall profile, the contrast between this stratum and Features 1 and 3 and Area 4 is striking (Figure 5).

Both the north and south wall evidence a large intrusion(s) of the overlying Zone 1 (A1) deposits into Feature 1, in Unit 1 on the south wall and in Unit 2 on the north wall. These are considered intrusions because, unlike the consistent appearance of Area 4 and other slope deposits, which receded regularly to the interior or exterior of the ring with depth, plan maps and photographs indicate irregular, amorphous areas of shelly midden that appeared and disappeared throughout the excavation of the relevant levels. Patches of crushed burned shell, some of which had a "weird smell" (field notes, on file, LSUMNS) were also associated with this intrusion. All aspects of this intrusion were segregated during excavation as Zone 1 and a series of Areas.

Two coquina "pot dumps[7]" were found within Zone 1. One, designated Feature 4, was on the western side of the ring, and was initially defined spreading into both Units 3 and 5. A small portion of this feature can be seen in the South Wall profile in Unit 3 (A4). A second such deposit, on the opposite side of the ring, can also be seen in the profile of Unit 6 (also A4).

One more lens is worthy of note. Another shell midden lens, Zone 1 Strong Brown (Figure 4, A2), appeared on either side of the ring, at or near the base of Zone 1. The shell and other inclusions in this deposit were the same as in Zone 1, but the soil matrix was distinctly browner. The presence of this lens on either side of the ring, as well as that of Feature 3, gives an impression of symmetry to the ring deposits.

The striking difference in the characteristics of Zone 1 and the features in the core of the ring suggests different depositional processes. Feature 1, and the later Feature 3, suggest intentional mounding of shell with little subsequent disturbance. The overlying Zone 1 may indicate the more common, accretional processes that produced many, if not most of the shell middens along the lower Atlantic coast; that is, daily discard of shell and bone, common trampling to both crush and homogenize many of the deposits, and the inclusion (intentional and unintentional) of soils to the shell matrix. On the other hand, it may be the result of millennia of humus and aeolian sand deposition accompanied by compaction by postdepositional prehistoric and historic activity.

Another type of shell midden underlay all of the aforementioned features. Feature 1, the core of the ring, overlay a thin (< 10 cm) shell midden (Zone 1BS [below shell]) very similar to Zone 1. This stratum was not visible in profile beneath Feature 1 but is apparent on the western side of the ring in both profiles. In plan, Zone 1BS was distinguished from Feature 1 material by the presence of more humic sand and both whole and crushed shell, but the stratum was irregular in area and in depth. It is unclear whether Zone 1BS represents mixing of Feature 1 materials with the underlying earth midden stratum (by trampling of initial Feature 1 deposits?) or whether this is a distinct deposit between the underlying earth midden and the feature.

The earth midden, which appears in profile in a gently sloping configuration (Figure 4, G1, G2, G4), was a dark gray to very dark gray, fine humic sand between 10 and 30 cm deep. This is a B horizon, not a buried A horizon (Scudder, personal communication, 1999). Sherds were common in this stratum; there was less small bone, but bone was still present. Shell was scattered to absent. This stratum could represent a period of site occupation prior to exploitation of estuarine resources, but it was co-extensive with the ring, suggesting that it is related.